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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/28/2000

R. Victor Klassen

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08/31/2006

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EXAMINER

NGUYEN, MADELEINE ANH VINH

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/750,552

Applicant(s)

KLASSEN ET AL.

Examiner

Madeleine AV Nguyen

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 6-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/01/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5 and 9-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant remarks that Gondek does not disclose a mid-point interpolation, but rather a series of iterative interpolations.

Gondek discloses a multivariable data storage, access, interpolation and transmission method for a continuum of data points using an n-dimensional space data construct. Gondek specifically teaches, "a rough approximation for a transform could be produced by using one of these eight points, or an average of these points-the "center" of the extracted cube-as the output value. This would produce a mapping that, in this example of 729 store values, provides 1241 possible output values, each corner plus each center." (col. 5, line 63 – col. 6, line 2), and furthermore, "We have reached a level of accuracy where 4096 output values are mapped to the input values if the "center" or average value of the eight new data points is provided as the transform result." (col. 6, line 64 – col. 7, line 3). Thus, it would have been obvious to one skilled in the art at the time the invention was made to consider the interpolation method used in Gondek is a mid-point interpolation since the new data points are at the center or mid-point of any two points in a subdivided cube.

If the mid-point interpolation in the claimed invention is different from Gondek, clarification in the claims is needed to overcome Gondek's teaching. It is noted that the claims must be given their broadest reasonable interpretation. During patent examination, the pending

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claims must be given their broadest reasonable interpretation consistent with the specification.

In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541m 550-51 (CCPA 1969).

In addition, mid-point interpolation is well known in the art. Oi et al (US Patent No. 5,142,675) supports that well-known prior art by teaching a process of a mid-point interpolation calculation for preparing a TRC color conversion table (col. 32, lines 11-52). Thus, Gondek is combined with Oi et al to modify the interpolation process in Gondek to a mid-point interpolation process since both of them also teach the color conversion from a first color space to a second color space using an interpolation process.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gondek (US Patent No. 5,748,176) in view of Oi et al (US Patent No. 5,142,675).

Concerning claims 15, 16, Gondek discloses a system for producing a specified color in a final color space comprising means for identifying the specified color value in a first color space (RGB input); a processing device for receiving a converted color space value being previously

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determined as a function of the specified color value and an interpolation and representing the specified color in the final color space (mapping process); and an output device (printer) for producing the converted color space value (Fig.6; col. 3, lines 35-54; col. 4, lines 37-63; col. 5, line 10 – col. 7, line 64).

Gondek does not specifically teach that the used interpolation is a mid-point interpolation. However, Gondek discloses a multivariable data storage, access, interpolation and transmission method for a continuum of data points using a n-dimensional space data construct. Gondek specifically teaches, “a rough approximation for a transform could be produced by using one of these eight points, or an average of these points-the “center” of the extracted cube-as the output value. This would produce a mapping that, in this example of 729 store values, provides 1241 possible output values, each corner plus each center.” (col. 5, line 63 – col. 6, line 2), and furthermore, “We have reached a level of accuracy where 4096 output values are mapped to the input values if the “center” or average value of the eight new data points is provided as the transform result.” (col. 6, line 64 – col. 7, line 3). Thus, it would have been obvious to one skilled in the art at the time the invention was made to consider the interpolation method used in Gondek is a mid-point interpolation since the new data points are at the center or mid-point of any two points in a subdivided cube. In addition, mid-point interpolation is well known in the art. Oi et al (US Patent No. 5,142,675) supports that well-known prior art by teaching a process of a mid-point interpolation calculation for preparing a TRC color conversion table (col. 32, lines 11-52). It would have been obvious to one skilled in the art at the time the invention was made to modify the interpolation process in Gondek to a mid-point interpolation process as a matter of

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well known in the art and since both of them also teach the color conversion from a first color space to a second color space using an interpolation process.

Gondek does not directly teach a memory device for storing the converted color space value. However, it was commonly known in the art to use a look-up table in the color conversion of image data from a first color space to a second color space. The Background of the Invention in Gondek supports that teaching (col. 2, lines 36-60). Furthermore, Gondek teaches “A method of data storage, access, interpolation,...” (Abstract), or “A method for storing, accessing, interpolating, and outputting a digital data point from a predetermined number of output digital data points” (col.8, lines 37-41). In addition, Oi et al also teach a process of mid-point interpolation calculation for preparing a TRC conversion table (col. 32, lines 25-52). It would have been obvious to one skilled in the art at the time the invention was made to combine the teaching of a look-up table as a memory for storing the converted color space value in Oi to Gondek as a matter of well known in the art, and since both of them also teach the color conversion from a first color space to a second color space using an interpolation process.

Concerning claims 10, 11, 17-20, Gondek further teaches that the output device is a xerographic output device (claims 10, 17); the output device is a digital output device (claims 11, 18); the mid-point interpolation as a function of an anchor vertex, as a function of the pixel value, and a first current vertex as a function of the pixel value and the anchor vertex, a current intermediate pixel value being determined via the mid-point interpolation as a function of the anchor and first current vertices (claim 19); the processing device performs an additional mid-point interpolation as a function of a second current vertex, as a function of the current pixel value, the anchor vertex and the first current vertex; a second current intermediate pixel value

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being determined via the mid-point interpolation as a function of the second current vertex and one of the anchor vertex and the first current vertex (claim 20).

Claims 1 and 9 are method claims of apparatus claim 15. Claims 1 and 9 are rejected for the same rationales set forth for claim 15.

Concerning claims 2-5, 12-14, Gondek further teaches the step of creating the final lookup table as a function of an initial lookup table, which has a lower resolution relative to the final lookup table and includes a plurality of conversion values, (mapping of bit triplets to octants sub-cubes of the original cube, col. 6, lines 9-14), (claim 2); for a current color of interest, performing a number of mid-point interpolations, as a function of the resolution of the final lookup table (the number of bit, e.g., 8 bit resolution, col. 4, lines 61-63), (claim 3); determining an anchor vertex (corner), which is defined within the final lookup table, as a function of the current color; determining a first current vertex (a different corner), which is defined within the final lookup table, as a function of the current color and the anchor vertex; and determining a current intermediate color (center or average point or intermediate point) by performing a mid-point interpolation as a function of the anchor and first current vertices, (col. 4, line 61 – col. 6, line 54), (claims 4, 13); if more than one mid-point interpolation is performed, determining a second current vertex, as a function of the current color, the anchor vertex, and the first current vertex; and determining a second current intermediate color by performing a mid-point interpolation as a function of the second current vertex and one of the anchor and first current vertices (new data points for each subdivision, col. 6, line 8 – col. 7, line 54), (claims 5, 14); performing a number of mid-point interpolations as a function of a resolution of the lookup table (col. 7, lines 4-64), (claim 12).

Allowable Subject Matter

4. Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: Claims 6-8 are allowable over the prior art of record because the Examiner found neither prior art cited in its entirety, nor based on the prior art, found any motivation to combine any of the said prior art which teaches a method for converting a specified color value from a first color space to a second color space as claimed in claims 1 and 4 wherein the steps of determining the anchor vertex and the current vertex include determining a vertex, which is defined within the final lookup table, as a function of a node in the first color space having largest coordinates less than corresponding coordinates of the specified color; and if the final lookup table is less than a predefined resolution, receiving a plurality of intermediate color space conversion values from the final lookup table, the converted color space value being determined as a function of the intermediate color space conversion values.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

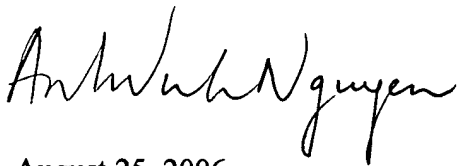
- a. Kasson et al (US Patent No. 5,751,926) discloses a function approximation using a centered cubic packing with tetragonal disphenoid extraction.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Madeleine AV Nguyen whose telephone number is 571 272-7466. The examiner can normally be reached on Tuesday-Thursday 12:30-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on 571 272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



August 25, 2006

Madeleine AV Nguyen
Primary Examiner
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